



# CrabTech

partially funded by The Norwegian Research Council: BIA programme

Primary objective:

**Develop a profitable and sustainable technology platform for harvesting snow crab based on Norwegian demands for EHS, salaries and product quality**



# CrabTech

## OUTLINE

- Partners & project organization
- WP's & Primary objective
- Challenges & Opportunities
- Snow crab fisheries in Newfoundland & Labrador
- Snow crab fisheries in Newfoundland & Labrador and in Barents Sea
- Whitefish fisheries in Norway – development in catch
- Automation



# CrabTech

## Partners

### Industry

- Project owner Opilio Ltd. (Br. Birkeland), boat: "North Eastern"
- Industry partner: Fitjar shipyard: a shipyard with long traditions in building, outfitting and maintenance of fishing- and supply vessels for the offshore industry
- Industry partner Mustad Autoline: develops and supplies technology to the world's line fishing fleet

### R&D

- Marine Institute (MI) Canada
- The University of Tromsø (UIT)
- SINTEF (Fisheries Tec. & Process Tech.)



# CrabTech

## Project (2015-2018)

The project is divided in three WP's

- WP 1 Efficient gear handling
- WP 2 Efficient processing
- WP 3 Sustainable harvesting



### Primary objective:

Develop a profitable and sustainable technology platform for harvesting snow crab based on Norwegian demands for EHS, salaries and product quality

Reduce manual work, eliminate unacceptable risk, find best practice for a sustainable fishery....

# CrabTech

## Project (2015-2018)

Arne Birkeland chairs the project and represents the project owner Opilio Ltd.



- Lasse Rindahl** (SINTEF) is the R&D project leader
- Roger Larsen** (The University of Tromsø) gear, selection, scientific surveys
- Paul Winger** (Marine Institute, Canada) gear, selection, sustainability, regulation, catch handling, biology
- Leif Grimsmo** (SINTEF) is responsible for SINTEF R&D automation/efficient processing

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## Challenges & Opportunities

### Challenges

- Automation of gear handling & baiting (6.000 cages...)
- Selection (?)
- EHS
- Efficient on-board processing
- Biology & quality (?)
- Management in international waters

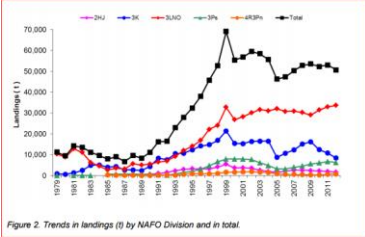
### Opportunities

- Established markets
- All year round production
- Automation & efficient processing
- Competitive wages for skilled labor
- By products



Snow crab fish. in Newfoundland & Labrador **CrabTech**

- Start late 1960s as by-catch in gillnet
- Small scale exploratory fisheries late 1980s
- First significant landings early 1990s (welcome supplement for declining groundfish resources...)



Snow crab fish. in Newfoundland & Labrador **CrabTech**

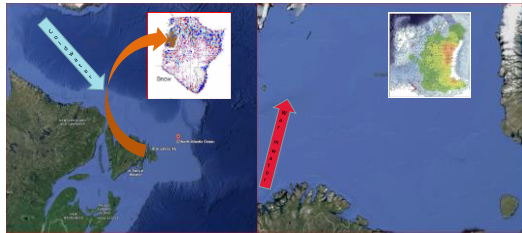
- Quota systems, trap limits, fishing areas, seasons
- 2013; 9,400 participants
- 3,000 land jobs, in 25 communities
- \$250 mill dollars (1,6 billion NOK)
- The most valuable fishery in Nfl. and Labrador



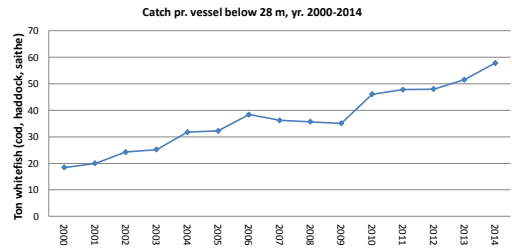
- Some differences in NE Atlantic / Barents Sea ...

Snow crab fish. in Newfoundland & Labrador and in Barents Sea: **CrabTech**

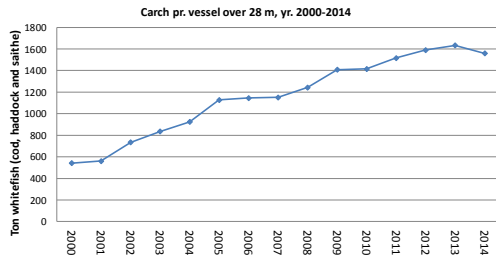
Newfoundland: Coastal fishery, Barents Sea: Offshore fishery



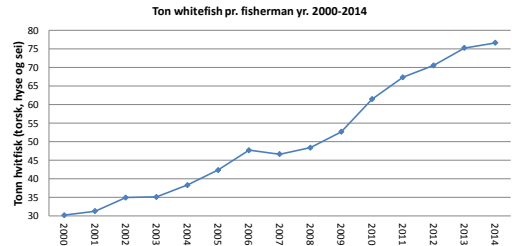
Catch coastal fishing boats (Norway) **CrabTech**



Catch seagoing fishing boats (Norway) **CrabTech**



Catch pr. fisherman... **CrabTech**



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## Whitefish fisheries (cod, saithe &amp; haddock) Norw. - development

- The fishing gears has been more effective (esp. Danish seiners)
- The **cod quotas** has **increased** to a high & sustainable(?) level
- Every fisherman got **2,5 times** more fish in 2014 than 15 yrs. earlier
- Average yearly catch both coastal < 28m & seagoing boats >28m was **three times** larger in 2014 than 15 yrs. Earlier
- What about; Quality? EHS? sustainability/value adding? ....  
>>> several user-driven Technology development projects: automated fish handling/evaluation/sorting etc.



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## CrabTech

## Automation

## Automation R&amp;D challenges

- Baiting
- Development of a machine vision based concept for size/weight prediction/measurement of crabs and other quality parameters (color, damages...)
- Development of a machine vision and robot-based concept for automated sorting and handling of crabs.
- Development and programming of robot control algorithms adapted for sorting and handling of crabs
- Adoption and/or development of effective grippers for handling and sorting of crabs

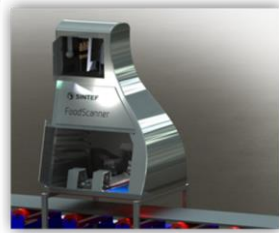
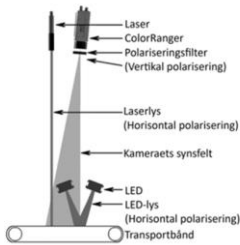


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## CrabTech

## Automation

## FoodScanner



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